

# Creating and Tracking your Staffing Plan

**Presented by: Al Glass**  
*Software Process Improvement (SPI) Project*



# Session Objectives

- **Understand why planning, tracking, and reporting project staffing is necessary**
- **Introduce techniques and tools that are available to GSFC software development teams to plan, track and report staffing levels**
- **Become familiar with parameters used plan, track and report staffing**
- **Introduce typical analysis done with staffing data to forecast staffing and assess project risk due to staffing**

# Topics

- **Planning your Staffing Profile**
- **Tracking and Reporting Actual Staffing**

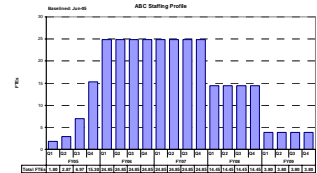
# Why plan for and track your staffing levels?



# Reduce your Risk!

- Chances of meeting project commitments significantly increases ... if :
  - The “right” people are in
  - The “right” roles for
  - The “right” period of time
- It’s unlikely that they will knock on your door when you need them...you’ll have to find them and arrange for them.
- So...planning staffing requirements and tracking actual staff delivered is essential for any project (small, large, short, long, acquisition, etc., etc.)
- For acquisition projects and small projects, staffing graphs and charts may not be as “interesting” but...
  - Cost and/or schedule impacts could be more severe because there are rarely backups ready to step in

# Planning Your Staffing Profile

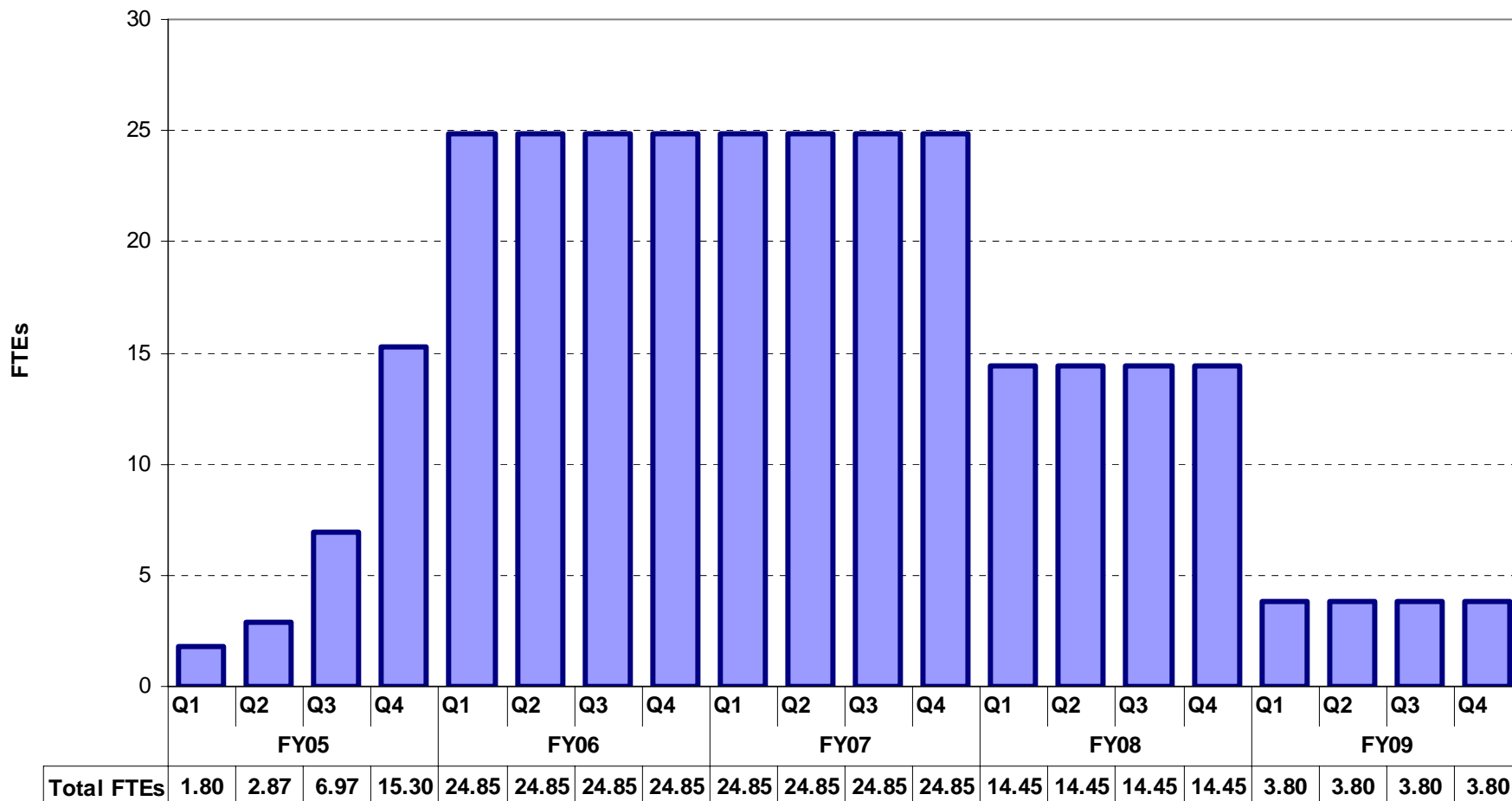


- **Use your Basis of Estimate (BOE) analysis to develop your staffing plan**
  - Number of staff
  - Experience of staff (e.g., skill mix, roles)
  - with your work schedule; plan staffing assignments in time
- **Identify any staffing constraints and document as a risk**
- **Document your staffing profile in your SMP/PP**
  - The staffing profile (i.e., staffing plan) is part of your *Initial Baseline Plan*

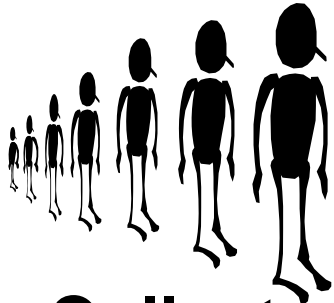
# Sample Staffing Profile

ABC Staffing Profile

Baselined: Jun-05



# Tracking and Reporting Staffing



**On a monthly basis:**

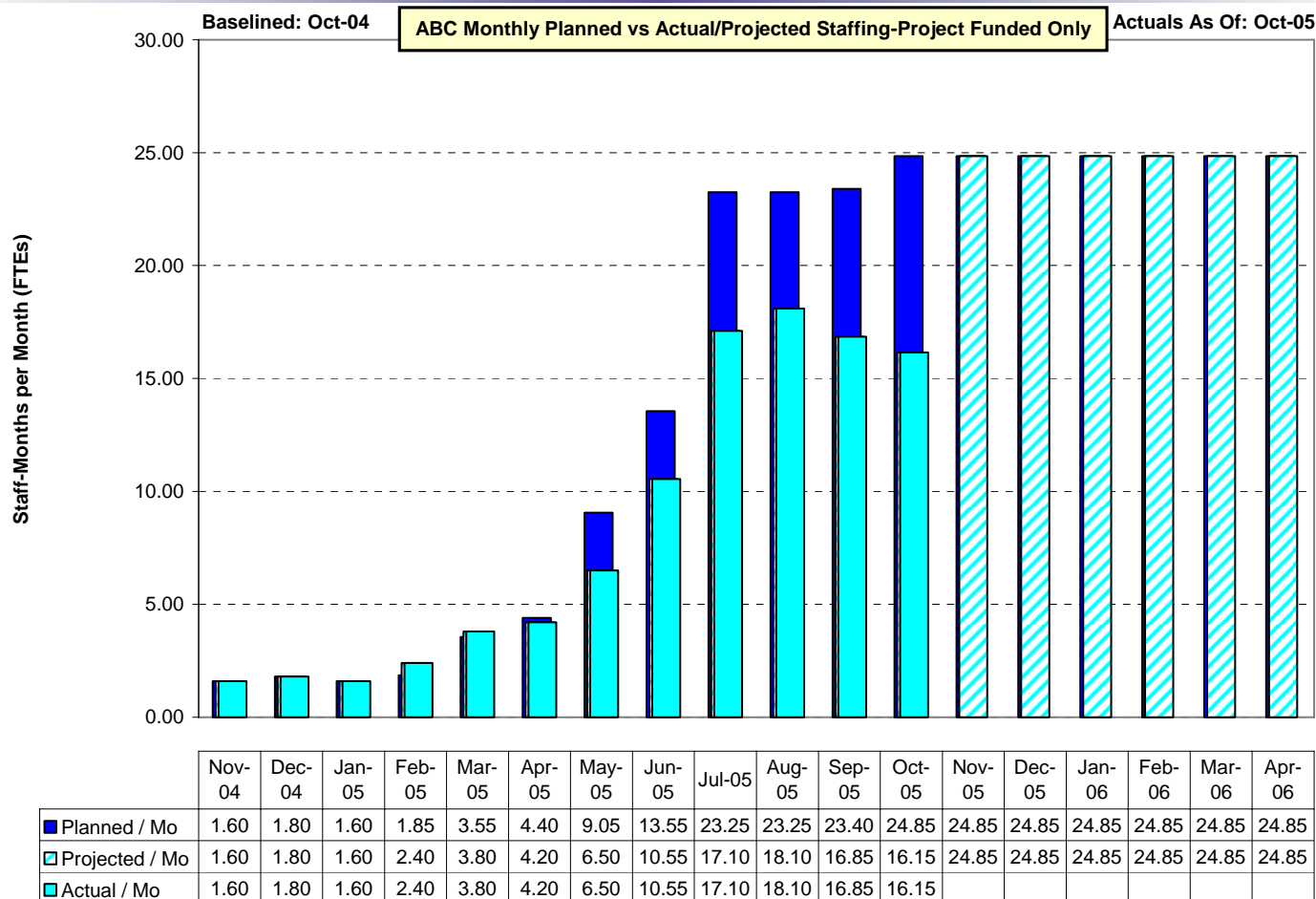


- **Collect staffing actuals (estimates are ok)**
- **Compare your staffing plan to your actuals (for the month and for the future)**
- **Analyze staffing variances**
- **Report staffing planned vs. actual with forecasts or associated analyses at your BSR**





# Sample Monthly Staffing Status Chart



**Analysis:** Personnel did not become available as planned this month

**Impact:** Some planned capabilities for Build 1 will have to be moved to later builds

**Corrective Action:** Meet with management to resolve the staffing issue ASAP; replan staffing based on results of the meeting.

# Analyzing Staffing Status (1 of 2)



- **Analyze the planned vs. actual staffing**
  - Is there a variance between your plan and your actuals?
  - What is causing the difference?
  - Given what you now know, does the plan for the next few months still seem realistic?
- **Analyze your staffing status in context of other status information you have (e.g., schedule progress)**
  - Did you expect to see a staffing variance?
  - Is the skill mix affecting performance? Should it be?
- **Assess current and potential impacts**
  - Is the understaffed or overstaffed condition causing any current impacts? Will it?

Planned

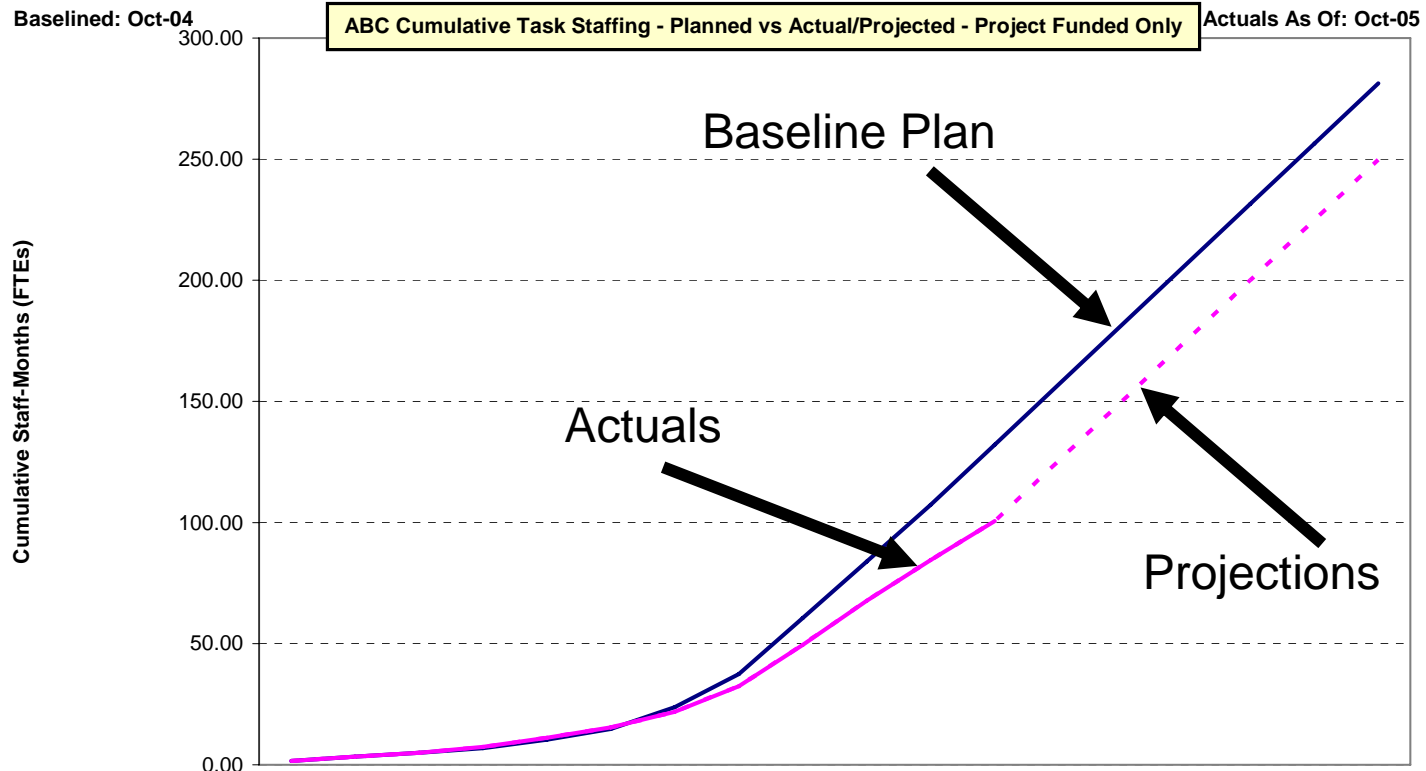


Actual

# Analyzing Staffing Status (2 of 2)

- **Determine what, if anything you need to do**
  - What corrective actions have you taken / will you take to minimize impacts?
  - Will adjustments to staffing plan help resolve other project variances (e.g., schedule variances, cost variances)?
  - *Operating Plan*: Minor adjustments to staffing to get back on baseline plan
  - *Replan*: Major change to staffing that will cause cost or schedule impact...(frequently due to a change in requirements)
- **Summarize and document your planned vs. actuals analysis:**
  - **Analysis:** Reason(s) for actuals varying from the plan
  - **Impact:** What may happen if we don't reduce the variance?
  - **Corrective Actions:** Actions planned or taken to resolve the variance (Be sure to track to closure!)

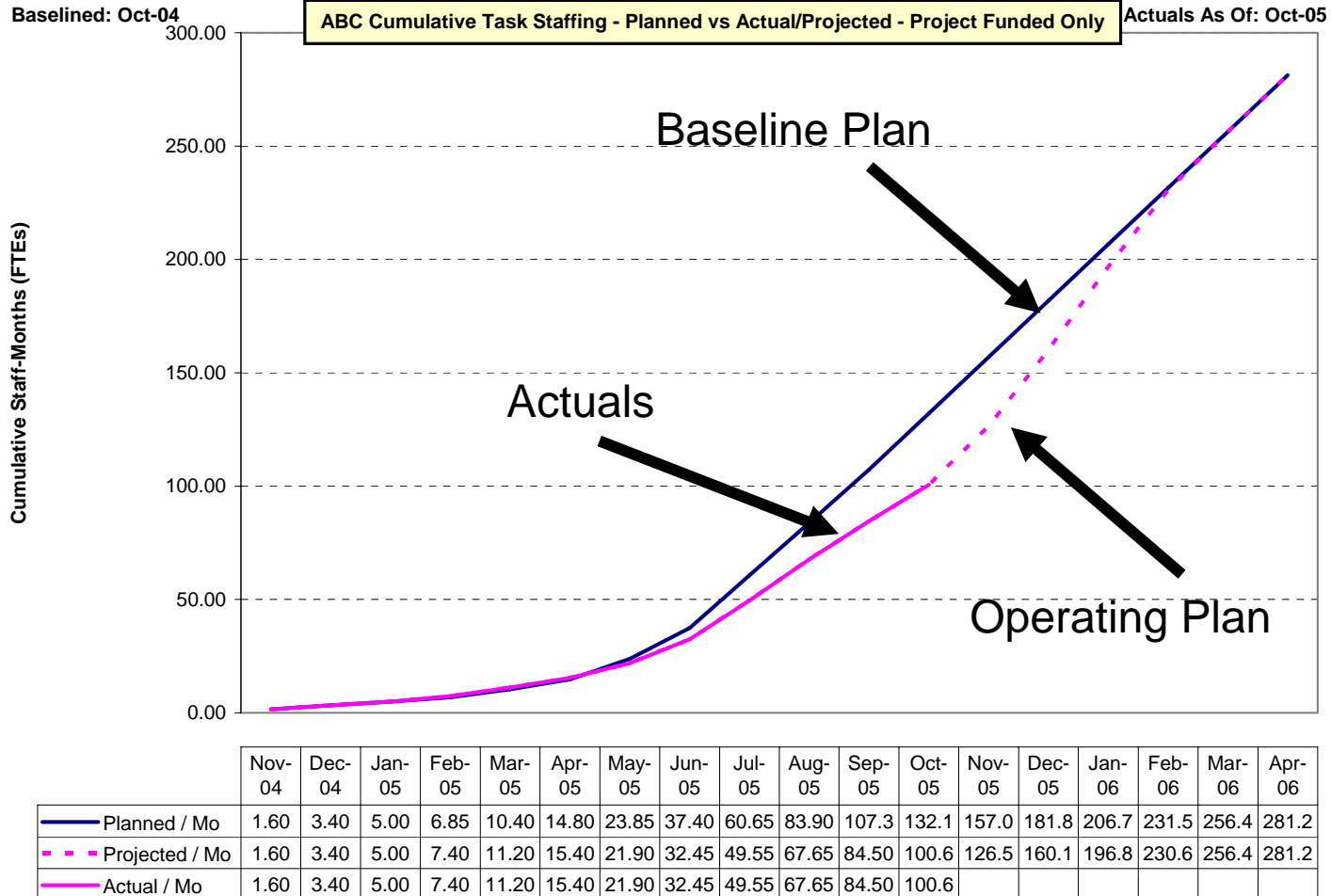
# 18-Monthly Staffing Chart (before any changes to baseline)



	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06
— Planned / Mo	1.60	3.40	5.00	6.85	10.40	14.80	23.85	37.40	60.65	83.90	107.3	132.1	157.0	181.8	206.7	231.5	256.4	281.2
- - - Projected / Mo	1.60	3.40	5.00	7.40	11.20	15.40	21.90	32.45	49.55	67.65	84.50	100.6	125.5	150.3	175.2	200.0	224.9	249.7
— Actual / Mo	1.60	3.40	5.00	7.40	11.20	15.40	21.90	32.45	49.55	67.65	84.50	100.6						

**Analysis:** Unanticipated personnel changes and unavailable replacements caused a later than planned staff-up  
**Impact:** Build content changes temporarily solved this problem, but long term schedule will likely be impacted  
**Corrective Action:** Meet with management to resolve the staffing issue ASAP; replan staffing and/or schedule based on results of the meeting

# 18-Monthly Staffing Chart (with an operating plan)

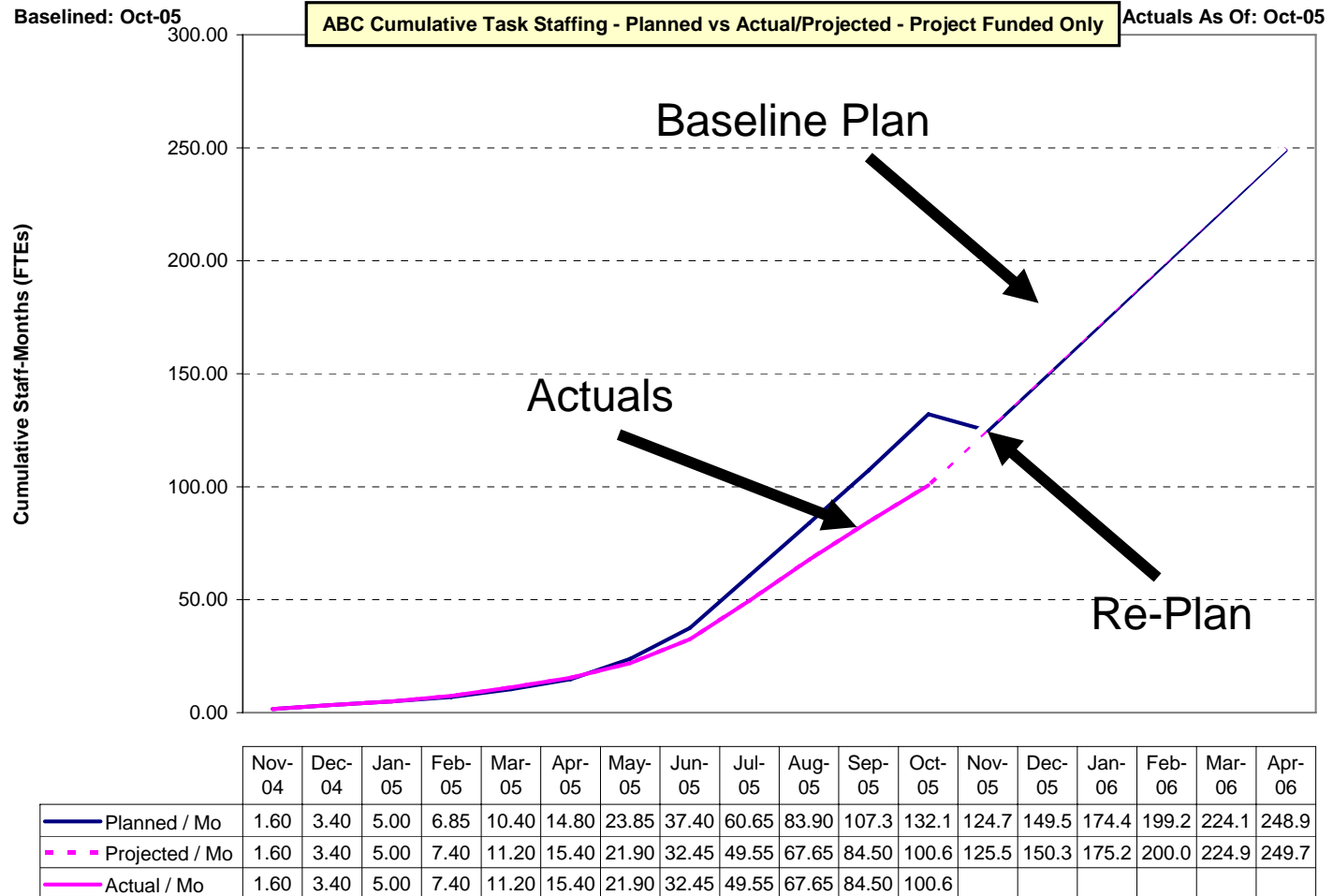


**Analysis:** Unanticipated personnel changes and unavailable replacements caused a later than planned staff-up

**Impact:** Build content changes temporarily solved this problem, but long term schedule will likely be impacted

**Corrective Action:** Based on management meeting, staffing plan was adjusted to temporarily add more staff than planned. This will allow us to get back on schedule with minimal impact to build contents.

# 18-Monthly Staffing Chart (with a re-plan)



**Analysis:** Unanticipated personnel changes and unavailable replacements caused a later than planned staff-up

**Impact:** Build content changes temporarily solved this problem, but long term schedule will likely be impacted

**Corrective Action:** Negotiations with the customer removed requirements allowing us to replan the staff.

**Management identified and committed to providing staff according to the new plan.**

# GSFC SPI Staffing Tool

- **The SPI Staffing Tool\*** supports planning: It helps you:
  - Establish planned staff by name, by month, in staff-months
  - Identify portion of each staff-month allocated to *listed process areas (Such as Project Management, Development, Testing, QA, CM, etc.)*
  - Automatically generate graphs of planned staffing
- **Supports Monitoring/Controlling/Reporting:** It helps you :
  - Input actual staffing estimates for each staff-month by process area
  - Plot planned versus actual staffing
  - Generate process staffing metrics and charts
  - Automatically generate status review charts for staffing

\*<http://software.gsfc.nasa.gov/tools.cfm>

# Staffing Plan and Actual Data

Monthly Staffing Plan																		
As Of: Dec-05																		
Task: ABC			Start of Ray's spreadsheet															
			3.20	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	8.00	8.50	9.00
			2003	2003	2003	2003	2003	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
Name	Role	Proc Wo	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jim	PDL	Mgmt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jim	PDL	ReqEng																
Alice	DTL	Mgmt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.50	1.00
Alice	DTL	ReqEng																
Joe	DE	Dev	0.60	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50			
Mike	DE	Dev																
Pete	DE	Dev		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
Alan	DE	Dev		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Steve	DE	Dev		0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.00	1.00	1.00
Jack	DE	Dev		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
dave	DE	Dev		0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.50	0.50	0.50
Dennis	DE	Dev														1.00	1.00	1.00
Mark	DE	Dev														1.00	1.00	1.00
Jay	DE	Dev																
Lisa	DTL	Mgmt	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lisa	DTL	ReqEng																
Bob	DE	Dev														0.50	0.50	0.50

Planned effort is input for the duration of the effort.

Actual effort is recorded monthly in collection worksheet that compares planned versus actual data.

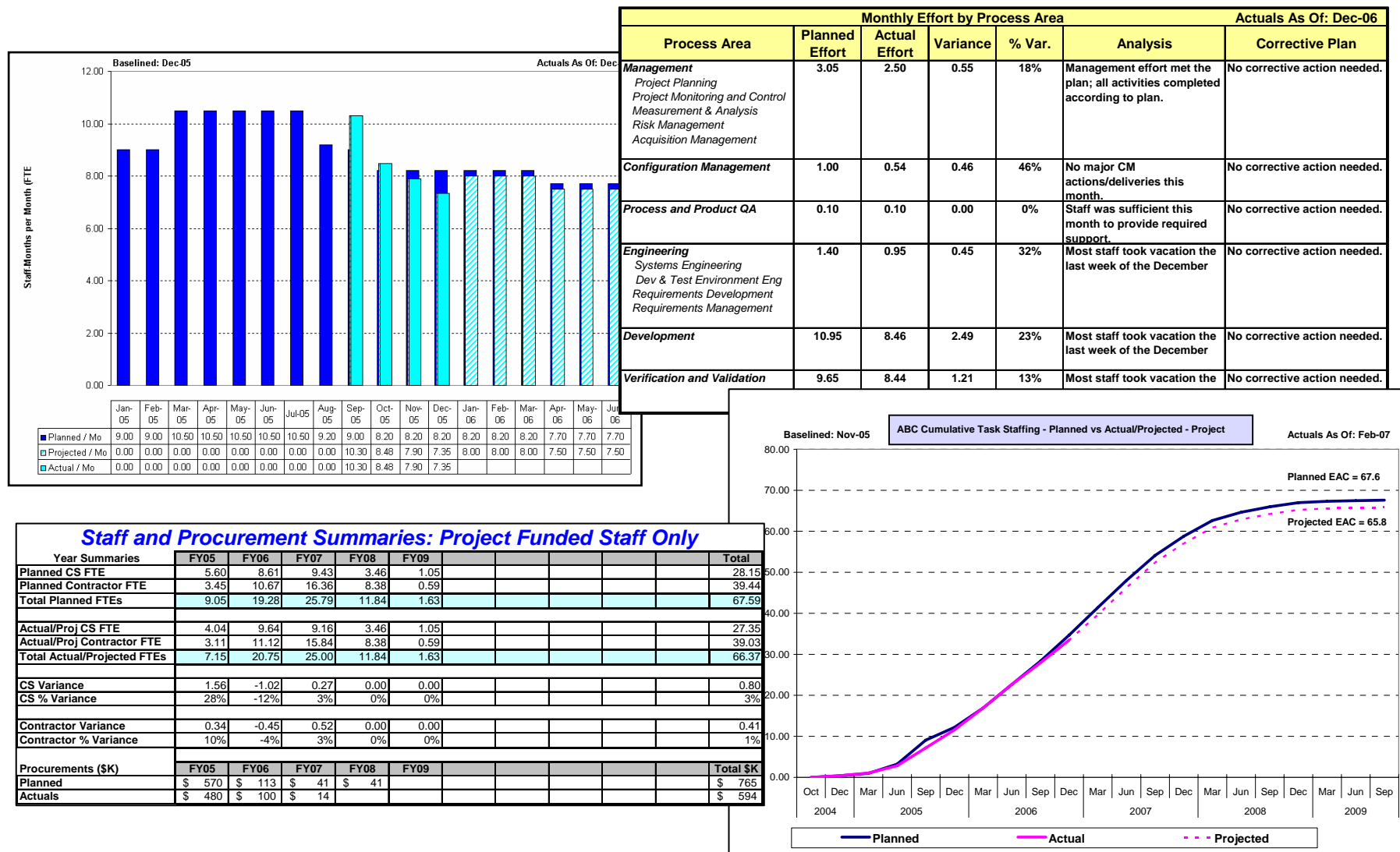
As Of: Dec-05			9.00	8.20	8.20	8.20	8.20	8.20	8.20	7.70	7.70	7.70	7.70
Task: ABC			10.30	8.48	7.90	7.35	8.00	8.00	8.00	7.50	7.50	7.50	7.50
			10.30	8.48	7.90	7.35	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			2005	2005	2005	2005	2006	2006	2006	2006	2006	2006	2006
Name	Role	Proc Wo	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Jim	PDL	Mgmt	0.90	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Jim	PDL	ReqEng		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Alice	DTL	Mgmt	0.90	0.80	0.80	0.65	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Alice	DTL	ReqEng		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Joe	DE	Dev	0.70	0.20	0.10	0.43	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Mike	DE	Dev											
Pete	DE	Dev	0.40	0.40	0.20	0.30	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Alan	DE	Dev	1.00	1.00	1.00	0.07	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Steve	DE	Dev	1.00	1.00	0.80	0.95	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Jack	DE	Dev											
dave	DE	Dev	1.00	0.50	0.50	0.75	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Dennis	DE	Dev	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mark	DE	Dev	1.00	1.00	1.00	0.70	1.00	1.00	1.00	0.50	0.50	0.50	0.50
Jay	DE	Dev	1.00	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lisa	DTL	Mgmt	0.90	0.80	0.80	0.65	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Lisa	DTL	ReqEng		0.10	0.10	0.35	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Bob	DE	Dev	0.50	0.38	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50



# A word about Process Effort Monitoring (Staffing Tool)

Monthly Effort by Process Area					Actuals As Of: Dec-06	
Process Area	Planned Effort	Actual Effort	Variance	% Var.	Analysis	Corrective Plan
<b>Management</b> <i>Project Planning</i> <i>Project Monitoring and Control</i> <i>Measurement &amp; Analysis</i> <i>Risk Management</i> <i>Acquisition Management</i>	3.05	2.50	0.55	18%	Management effort met the plan; all activities completed according to plan.	No corrective action needed.
<b>Configuration Management</b>	1.00	0.54	0.46	46%	No major CM actions/deliveries this month.	No corrective action needed.
<b>Process and Product QA</b>	0.10	0.10	0.00	0%	Staff was sufficient this month to provide required support.	No corrective action needed.
<b>Engineering</b> <i>Systems Engineering</i> <i>Dev &amp; Test Environment Eng</i> <i>Requirements Development</i> <i>Requirements Management</i>	1.40	0.95	0.45	32%	Most staff took vacation the last week of the December	No corrective action needed.
<b>Development</b>	10.95	8.46	2.49	23%	Most staff took vacation the last week of the December	No corrective action needed.
<b>Verification and Validation</b>	9.65	8.44	1.21	13%	Most staff took vacation the last week of the December	No corrective action needed.

# Reporting your Staffing Situation



# Staff Planning, Monitoring and Reporting – Sample Artifacts

- **SMP/PP sections containing staff-related topics such as organization, roles and responsibilities, and staffing profile**
- **Sequence of dated copies of the Staffing Planned vs Actuals (every month)**
  - Initial copy showing only the initial Baseline Plan
  - Subsequent copies containing the plan/actuals history to date, current projections, and history of staffing changes (text description of changes)
  - Each copy shows that incremental updates are being made
- **Sequence of dated copies of the Staffing Analysis (every month)**
  - Monthly staffing analysis and results
  - Demonstrates periodic assessment and review of progress
- **Records of all staffing-related corrective actions taken and tracked to closure**

# Summary

- **Select roles that define responsibilities for ALL work to be performed**
  - **Management, process, and technical responsibilities**
- **Use a tool to plan your staffing levels across the duration of the project**
  - **Use the BOE to assist in estimating staffing levels and needed roles**
  - **Baseline your initial plan and re-baseline it only when a replan is needed**
  - **Use projections (i.e., operating plans) to show changes to staff that define your path to getting back on plan**
  - **Collect your staffing actuals and analyze them against your plan each month**

# Summary

- **Report staffing in your status review**
  - **Report the staffing plan and actuals and your analysis of the raw data**
  - **Report the real and/or projected impact of any variances on your performance**
  - **Report the corrective actions taken or planned to be taken and track those actions to closure**
- **See <http://software.gsfc.nasa.gov/tools.cfm> for free tools**

# *Questions?*

# Acronyms

# Acronyms (1 of 4)

<b>ACQ</b>	<b>Acquisition</b>
<b>AM</b>	<b>Acquisition Manager</b>
<b>BOE</b>	<b>Basis of Estimate</b>
<b>BSR</b>	<b>Branch Status Review</b>
<b>CCB</b>	<b>Configuration Control Board</b>
<b>CCR</b>	<b>Configuration Change Request</b>
<b>CDR</b>	<b>Critical Design Review</b>
<b>CM</b>	<b>Configuration Management</b>
<b>CMMI</b>	<b>Capability Maturity Model Integrated</b>
<b>CMO</b>	<b>Configuration Management Officer</b>
<b>COTR</b>	<b>Contracting Officer's Technical Representative</b>
<b>COTS</b>	<b>Commercial Off-the-Shelf</b>
<b>CR</b>	<b>Change Request</b>
<b>CSCI</b>	<b>Computer Software Configuration Item</b>
<b>D&amp;I</b>	<b>Design &amp; Implementation</b>
<b>DCR</b>	<b>Discrepancy or Change Request</b>
<b>DE</b>	<b>Development Engineer</b>



## Acronyms (2 of 4)

<b>DM</b>	<b>Data Management</b>
<b>DML</b>	<b>Data Management List</b>
<b>DTL</b>	<b>Development Team Lead</b>
<b>FCA</b>	<b>Functional Configuration Audit</b>
<b>FSB</b>	<b>Flight Software Branch</b>
<b>FSW</b>	<b>Flight Software</b>
<b>GOTS</b>	<b>Government Off-the-Shelf</b>
<b>GPR</b>	<b>Goddard Procedural Requirement</b>
<b>ICD</b>	<b>Interface Control Document</b>
<b>IRB</b>	<b>Internal Review Board</b>
<b>ISD</b>	<b>Information Systems Division</b>
<b>IV&amp;V</b>	<b>Independent Verification and Validation</b>
<b>M&amp;A</b>	<b>Measurement &amp; Analysis</b>
<b>MA</b>	<b>Measurement &amp; Analysis</b>
<b>ME</b>	<b>Maintenance Engineer</b>
<b>MTL</b>	<b>Maintenance Team Lead</b>
<b>NPR</b>	<b>NASA Procedural Requirement</b>

## Acronyms (3 of 4)

<b>PAL</b>	<b>Process Asset Library</b>
<b>PCA</b>	<b>Physical Configuration Audit</b>
<b>PDL</b>	<b>Product Development Lead</b>
<b>PDR</b>	<b>Preliminary Design Review</b>
<b>PDT</b>	<b>Product Development Team</b>
<b>PMC</b>	<b>Project Monitoring and Control</b>
<b>PP</b>	<b>Project Planning</b>
<b>PPQA</b>	<b>Product and Process Quality Assurance</b>
<b>QA</b>	<b>Quality Assurance</b>
<b>REQ</b>	<b>Requirements Engineering</b>
<b>RFA</b>	<b>Request for Action</b>
<b>RFP</b>	<b>Request for Proposal</b>
<b>RID</b>	<b>Review Item Disposition</b>
<b>RSKM</b>	<b>Risk Management</b>
<b>SA</b>	<b>Software Assurance</b>
<b>SAMP</b>	<b>Software Acquisition Management Plan</b>
<b>SE</b>	<b>System Engineer</b>

# Acronyms (4 of 4)

<b>SM</b>	<b>Software Manager</b>
<b>SMP</b>	<b>Software Management Plan</b>
<b>SOW</b>	<b>Statement of Work</b>
<b>SPI</b>	<b>Software Process Improvement</b>
<b>SQA</b>	<b>Software Quality Assurance</b>
<b>SQE</b>	<b>Software Quality Engineer</b>
<b>SRR</b>	<b>System (or Software) Requirements Review</b>
<b>STE</b>	<b>Simulator/Tools Engineer</b>
<b>SW</b>	<b>Software</b>
<b>TE</b>	<b>Test Engineer</b>
<b>TTL</b>	<b>Test Team Lead</b>
<b>V&amp;V</b>	<b>Verification &amp; Validation</b>
<b>VDD</b>	<b>Version Description Document</b>
<b>WBS</b>	<b>Work Breakdown Structure</b>